Improved nutrient management: Capturing benefits from differences in water and solute movement. (S01-bristow164416-Oral)

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Abstract:

Criticism of agricultural industries, and particularly of irrigation industries, which use large quantities of nutrients and other agrochemicals will continue to increase if unwanted environmental impacts associated with these industries are not adequately addressed. Progress in these areas will require greater understanding and better management of the storage, transport and fate of water, and especially of the solutes (salts, nutrients and agrochemicals) associated with the water. In this paper we use simulation modeling to explore the interacting effects of capillarity, gravity and soil structure on solute transport, and suggest that benefits of some counter-intuitive outcomes can be used to advantage in improving nutrient management. We highlight in particular that when fertigating with nitrate in subsurface trickle irrigated systems, you must apply nitrate at the beginning of the irrigation event rather than near the end of the irrigation event. This allows one to take advantage of capillarity and results in greater quantities of nitrate being held higher in the rootzone above the emitter, thereby reducing the risk of losses through nitrate leaching.

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